CLAIMS

1. An identification tag (100) for use in a location system (400) for determining the identification tag's (100) location in room in a building or areas to be monitored, characterised in that the identification tag (100) comprises an ultrasonic transducer (190) connected to a receiver (180) adapted to receive ultrasonic signals, together with a radio transmitter (170) connected to an antenna (195) adapted to transmit radio signals with information containing the identity of the identification tag.

2. An identification tag (100) according to claim 1, characterised in that the ultrasonic transducer (190) is connected to the receiver unit (180) in order to detect ultrasonic pulses with different frequencies or codes that are transmitted from one or more master units (200) and slave units (300) which transmit the different frequencies or codes.

3. An identification tag according to claim 1, characterised in that the receiver unit (180) is connected to a control unit (160).

4. An identification tag (100) according to claim 2, characterised in that it further comprises a calculating unit (165) connected to a control unit (160) arranged to calculate transit time differences for the received ultrasonic pulses.

5. An identification tag (100) according to claim 3, characterised in that the control unit (160) is arranged to cause the radio transmitter to transmit the radio signals in response to the identification tag's (100) calculating unit (165) having calculated transit time differences for the received ultrasonic pulses.

6. An identification tag (100) according to claim 5, characterised in that it further comprises a sabotage unit (110) connected with the control unit (160) for detecting any attempt to remove and/or open the identification tag (100), and where, after such detection, the control unit (160) is adapted to add such additional information to the radio signal transmitted from the identification tag (100).

7. An identification tag (100) according to claim 1, characterised in that it further comprises a radio receiver (175) connected to the control unit (160) for receiving information on which room or area

it is located in, with the result that the identification tag (100) does not need to listen continuously for ultrasonic signals.

8. A system (400) for position determination of at least one identification tag (100),
characterised in that it comprises:
- at least one stationary master unit (200), with an ultrasonic transducer (265) for transmitting ultrasonic signals in the form of ultrasonic pulses and a receiver unit (270) for receiving instructions from at least one central processing unit (410),
- at least one identification tag (100) according to claims 1-7 for transmitting the identification tag's (100) identification as well as measured transit time differences for received ultrasonic pulses together with any additional information,
- a network (215) interconnecting master units (200) with the central processing unit (410) for transfer of instructions,
- means in the central processing unit (410) for calling up identification tags (100) as well as detecting, collecting and interpreting received radio signals from the identification tags (100), and
- processing means in the central processing unit (410) for determining the position of the identification tags (100).

9. A system according to claim 8,
characterised in that the system further comprises at least one stationary slave unit (300) with an ultrasonic transducer for transmitting ultrasonic signals in the form of ultrasonic pulses.

10. A system according to claims 8 and 9,
characterised in that the system comprises one master unit (200) and at least three slave units (300).

11. A system according to claims 8 and 9,
characterised in that a network (215) interconnects stationary master units (200) and slave units (300) for transferring a synchronisation message from the master unit (200).

12. A system according to claims 8 and 9,
characterised in that stationary master units (200) and slave units (300) each transmit ultrasonic waves on their own frequency or with their own coding.

13. A system according to claim 8,
characterised in that the stationary master units (200) comprise means

(210, 230) for transmitting a synchronisation message to all stationary slave units (300) with which it is connected.

14. A system according to claim 8, characterised in that the connection between master units (200) and the central processing unit (410) is based on radio waves.

15. A system according to claim 8, characterised in that the connection between master units (200) and the central processing unit (410) is wire-based.

16. A system according to claim 8, characterised in that stationary slave units (300) comprise means for receiving a synchronisation message from a stationary master unit (200) with which it is in network connection.

17. A system according to claims 8 and 16, characterised in that the network connection connecting stationary master units (200) and slave units (300) is radio-based.

18. A system according to claims 8 and 16, characterised in that the network connection connecting stationary master units (200) and slave units (300) is wire-based.

19. A method for position determination of one or more identification tags (100) in a room in a building or areas that require to be monitored, characterised in that the method comprises:
a) transmitting a radio message from a central processing unit (410) to stationary master units (200),
b) transmitting a synchronisation message from the stationary master units (200) to stationary slave units (300),
c) transmitting ultrasonic pulses synchronously from the stationary master units (200) and the slave units (300),
d) receiving the ultrasonic pulses for the identification tags (100) according to claims 1-7,
e) calculating arrival times for received ultrasonic pulses in the identification tag (100),
f) transmitting radio signals containing arrival times for received ultrasonic pulses together with identification of the identification tag (100) to a central processing unit (410),
g) calculating the position of the specific identification tag (100) in the central processing unit (410) on the basis of received identification and transit time differences transmitted from the identification tag (100),

together with knowledge of the position of each individual stationary master unit (200) and slave unit (300) in every room or area.

20. A method according to claim 19, characterised in that the synchronisation message contains information on which frequency or code has to be employed.

21. A method according to claim 19, characterised in that stationary master units (200) and slave units (300) each transmit on their own code 1–n.

22. A method according to claim 19, characterised in that the radio message from the central processing unit (410) to the stationary master units (200) is initiated by a user requesting an update of positions via a user interface on the central processing unit (410).

23. A method according to claim 19, characterised in that the radio message from the central processing unit (410) to the stationary master unit (200) is initiated by an identification tag (100) transmitting a request via radio signals to the central processing unit (410).

24. A method according to claim 19, characterised in that identification tags (100) containing a radio receiver (175) in addition to an ultrasonic receiver (180) will switch on the ultrasonic receiver (180) only when master units and slave units are to transmit ultrasonic pulses in the area where they are called up by listening to radio signals transmitted from the stationary calculating unit (410) to the master units.

25. A method according to claim 19, characterised in that identification tag (100) transmits a request for initiation to the central processing unit (410) when an attempt is made to open or move it.